

Unit 9 – Acceleration (Ch.13)**Chapter 13.1 – Accelerating Objects**

1. A change in velocity occurs when the speed of an object changes, or its _____ of motion changes, or _____.
2. _____ is the rate at which an object changes its _____. The _____ acceleration is the change of velocity divided by the _____ for the change.
3. To calculate a change in velocity subtract the _____ velocity from the _____ velocity.
4. Calculate the acceleration of the following objects:
 - a. A woman riding a bicycle is travelling forward at 5m/s and increases her velocity to 20m/s in 5s.
 - b. You throw a tennis ball at a wall and it hits the wall going 25m/s. The ball rebounds off the wall at 15m/s back towards you in 0.5s.
 - c. You are driving a car at 20m/s. Suddenly a dog runs out in front of your car and you slow to a stop in 2s.
5. An object in uniform motion that is travelling at a constant velocity has no _____, unless the object is constantly changing directions like a Ferris wheel.
6. Objects fall because the force of _____ attracts them to Earth. For small dense objects we assume the effect of air resistance is _____.

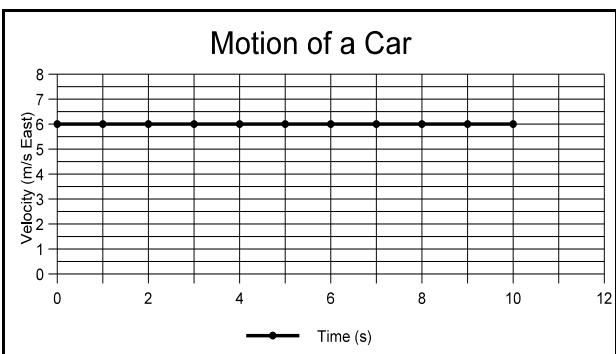
7. If a car is moving forward and increases its velocity in the _____ direction the acceleration is said to be _____. If a car is moving forward and starts _____ its velocity in the forward direction the acceleration is said to be _____.
8. Calculate the change in velocity of the following objects:
- a. A runner at rest accelerates forward at 2.0m/s^2 for 6s.
 - b. A car screeches to a halt with a negative acceleration of -15m/s^2 in 1.5s.
 - c. A baseball leaves a bat with an acceleration of 20m/s and it accelerates for 2.5 seconds.
9. Calculate the change in time of the following scenarios:
- a. A car moving 20m/s forward slows to a stop. If the car decelerates at 5m/s^2 , how long does it take for the car to come to a stop?
 - b. A train going 20m/s increases its velocity to 40m/s in the same direction. If the train accelerates at 4m/s^2 , how long does the train accelerate for?
 - c. A girl on rollerblades is travelling 9m/s in the forward direction; she slows down to 2m/s in the same direction, how long does she decelerate for if she decelerates at 1m/s^2 ?

10. A ball is thrown upward with an initial velocity of 20m/s. What will the ball's velocity be after 2s? The acceleration of gravity is 9.8m/s^2 down.
11. A marble is thrown upward with an initial velocity of 30m/s. What will the ball's velocity be after 5s? The acceleration of gravity is 9.8m/s^2 down.
12. After accelerating at 6m/s^2 [E] for 2.5s, a truck's velocity is 30m/s [E]? What was the truck's initial velocity?
13. After accelerating at 3m/s^2 [E] for 5s, a car's velocity is 12m/s [W]? What was the car's initial velocity?

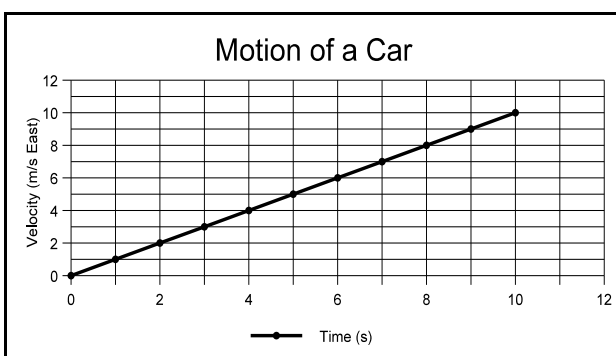
Chapter 13.2 – Graphing Accelerated Motion

1. A straight line on a velocity-time graph represents a _____ acceleration.
2. The slope of a line on a velocity-time graph represents an object's _____.
3. Positive and negative acceleration both depend upon the _____ that the object is initially moving. A _____ slope on a velocity-time graph indicates the object has a positive acceleration, and a _____ slope on a velocity-time graph indicates the object has a negative _____.

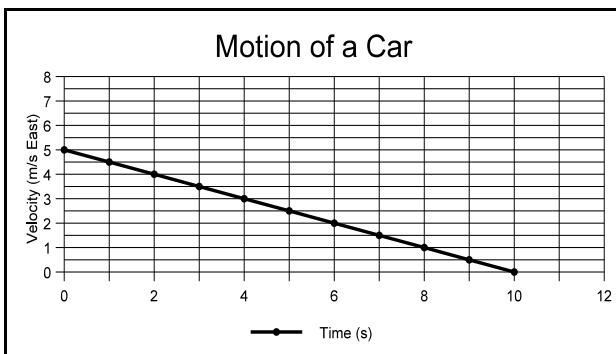
4. Using the velocity-time graph at right, calculate the displacement of the car over the 10s interval.



5. Using the velocity-time graph above, calculate the displacement of the car over the 10s interval.



6. Using the velocity-time graph above, calculate the displacement of the car over the 10s interval.



7. What is instantaneous acceleration and how can we calculate it from a velocity-time graph?

Chapter 13.4 – Objects in Motion

1. What are the three types of motion graphs?
2. When a falling object reaches a point where the upward forces equal the downward forces, that object is travelling at a constant velocity known as _____.

Vocabulary to Know

Write a concise definition of each of these terms found in this chapter.

Acceleration-

Gravity -

Instantaneous acceleration -

Negative acceleration -

Positive acceleration -

Terminal velocity -

Velocity-time graph -